# Motor Driver Shield 10A

# User's Manual

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## 1.0 INTRODUCTION

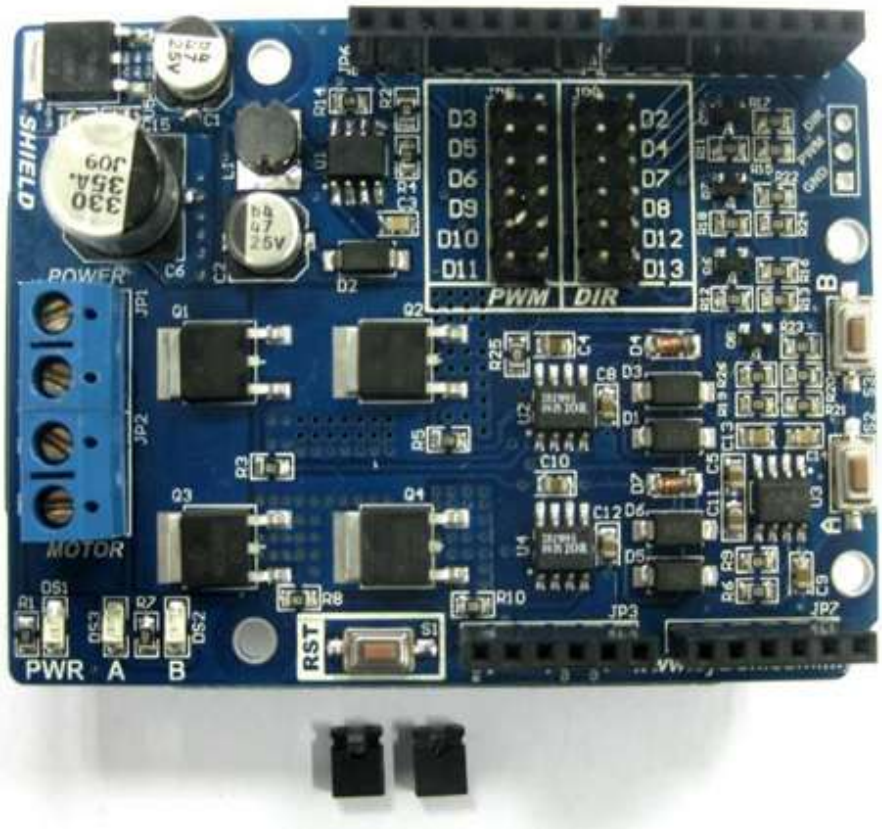
This is an Arduino shield for controlling and driving high current DC motor up to 10A continuously. It is compatible with Arduino uno, Arduino mega, Arduino Nano and arduino Leonardo and possibly other pin compatible main boards. The shield uses full solid state components which results in faster response time and eliminates the wear and tear of the mechanical relay. This motor driver shield module has stackable side headers which allows for more Arduino shields to be stacked on top of it.

The Driver shield come with these features:

- Bi-directional control for 1 brushed DC motor.
- Support motor voltage ranges from 7V to 25V.
- Maximum current up to 10A continuous and 15A peak (10 seconds).
- 3.3V and 5V logic level input.
- Solid state components provide faster response time and eliminate the wear and tear of mechanical relay.
- Fully NMOS H-Bridge for better efficiency and no heat sink is required.
- Speed control PWM frequency up to 10KHz.
- Stackable I/O header pin.
- Selectable digital pins for PWM and DIR.

## 2.0 PACKING LIST

Please check the parts and components according to the packing lists. If there are any parts missing, please contact us .




1. 1 x  arduino shield
2. 2 x mini jumper

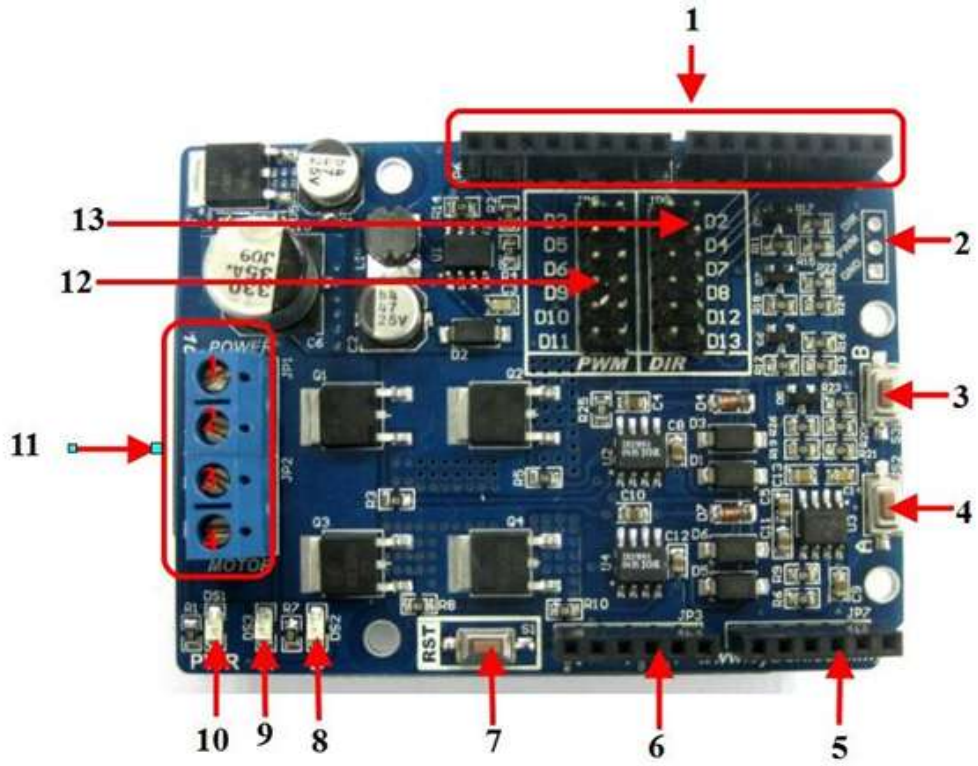
## 3.0 PRODUCT SPECIFICATION AND LIMITATIONS

**Absolute Maximum Rating**

| Parameter | Min | Typical | Max | Unit |
|---|---|---|---|---|
| Power Input Voltage (Motor supply voltage) | 7 | - | 25 | V |
| $I_{MAX}$ (Maximum Continuous Motor Current) | - | - | 10 | A |
| $I_{PEAK}$ (Peak Motor Current)* | - | - | 15 | A |
| $V_{IOH}$ (Logic Input-High Level) | 3 | - | 5.5 | V |
| $V_{IOL}$ (Logic Input - Low Level) | 0 | 0 | 0.5 | V |
| Maximum PWM Frequency | - | - | 10 | KHz |

***Must not exceed 10 seconds***

## 4.0 BOARD LAYOUT




1. **Stackable Digital I/O Headers**
   JP4 and JP6 are Digital I/O pins stacked to the Arduino main board.

2. **Optional External Control**
   External control is for the use of other types of microcontroller besides Arduino.

3. **Test Button B**
   When this button is pressed, current flows from output B to A and motor will turn CCW (or CW depending on the connection).

4. **Test Button A**
   When this button is pressed, current flows from output A to B and motor will turn CW (or CCW depending on the connection).

5. **Stackable Analog Input Header**
   This is the analog port of the Arduino and is not used by SHIELD-.. The stackable header allows other stacked shield to utilize these pins.

6. **Stackable Power Pins Header**
   This is the power port of the Arduino. Only RST and GND pins are connected to the SHIELD-.. The stackable header allows other stacked shield to utilize these pins.

7. **Reset Button**
   Reset button is for the convenience of user to reset the Arduino main board.

8. **Red LED B**
   Turns ON when the output A is low and output B is high. Indicates the current flows from output B to A.

9. **Red LED A.**
   Turns ON when the output B is low and output A is high. Indicates the current flows from output A to B.

10. **Green Power LED**
    Turn on when the SHIELD-. is powered up.

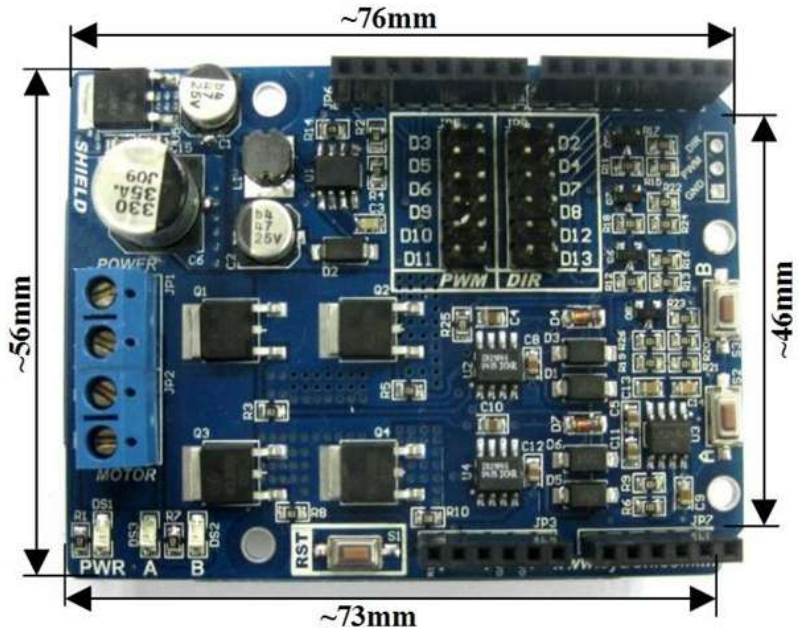
11. **Terminal Block**
    Connect to motor and power source.

| Pin No. | Pin Name | Description |
|---|---|---|
| 1 | POWER + | Positive supply |
| 2 | POWER - | Negative supply |
| 3 | Motor Output A | Connect to motor terminal A |
| 4 | Motor Output B | Connect to motor terminal B |

12. **PWM Pin Selector**
    User may select D3, D5, D6, D9, D10 or D11 as the PWM pin for SHIELD-. with the mini jumper.

13. **DIR Pin Selector**
    User may select D2, D4, D7, D8, D12 or D13 as the direction pin for SHIELD-. with the mini jumper.

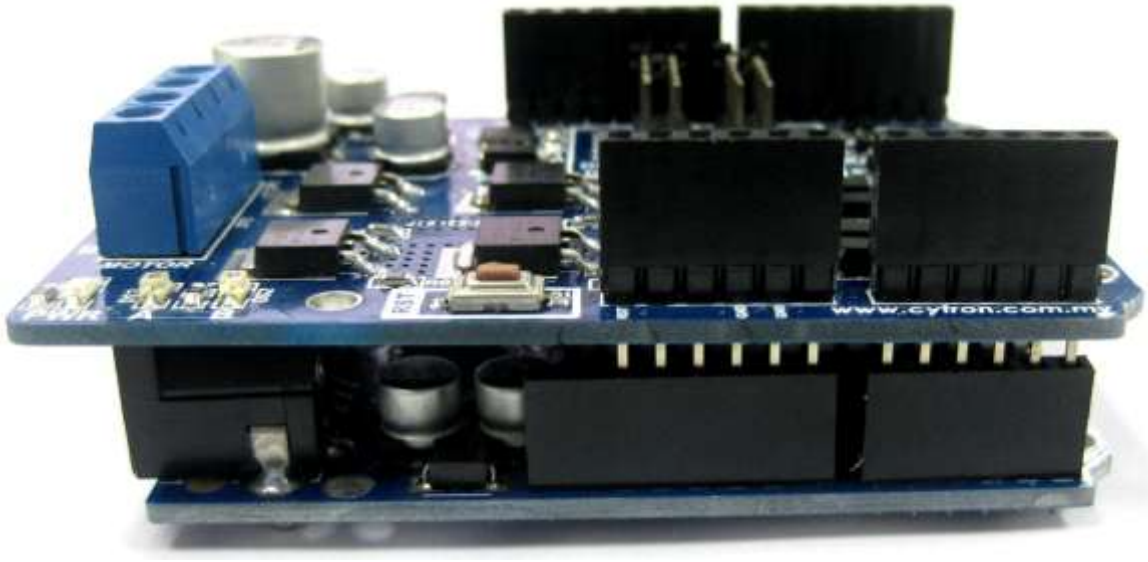
## 5.0 DIMENSION



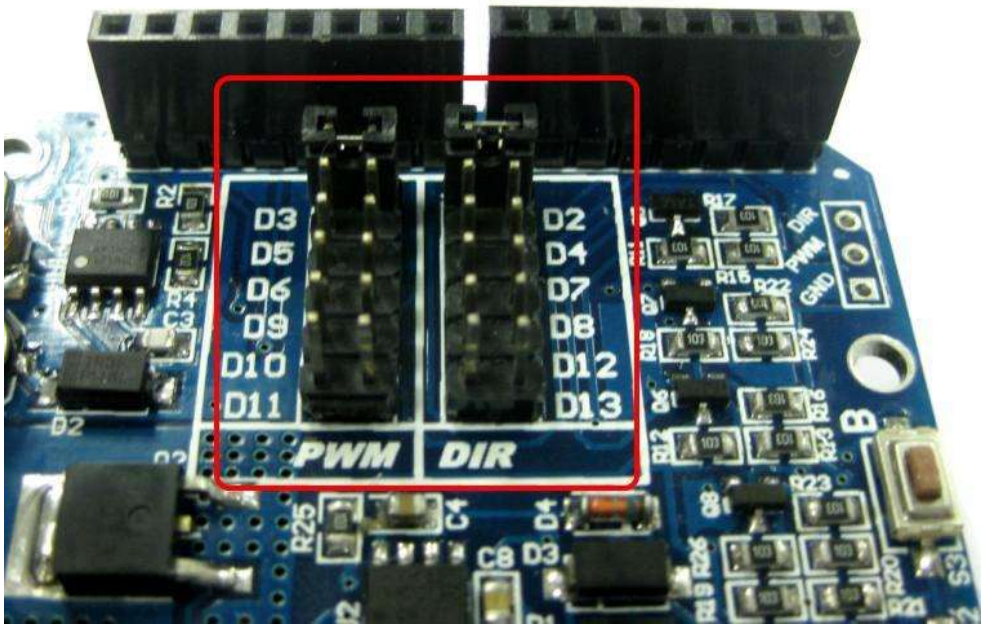

## 6.0 HARDWARE INSTALLATION

This section shows the example of using the shield with Arduino UNO as the main controller to control a brush motor. However, other Arduino main board such as Arduino Leonardo and Arduino Mega can also be used.

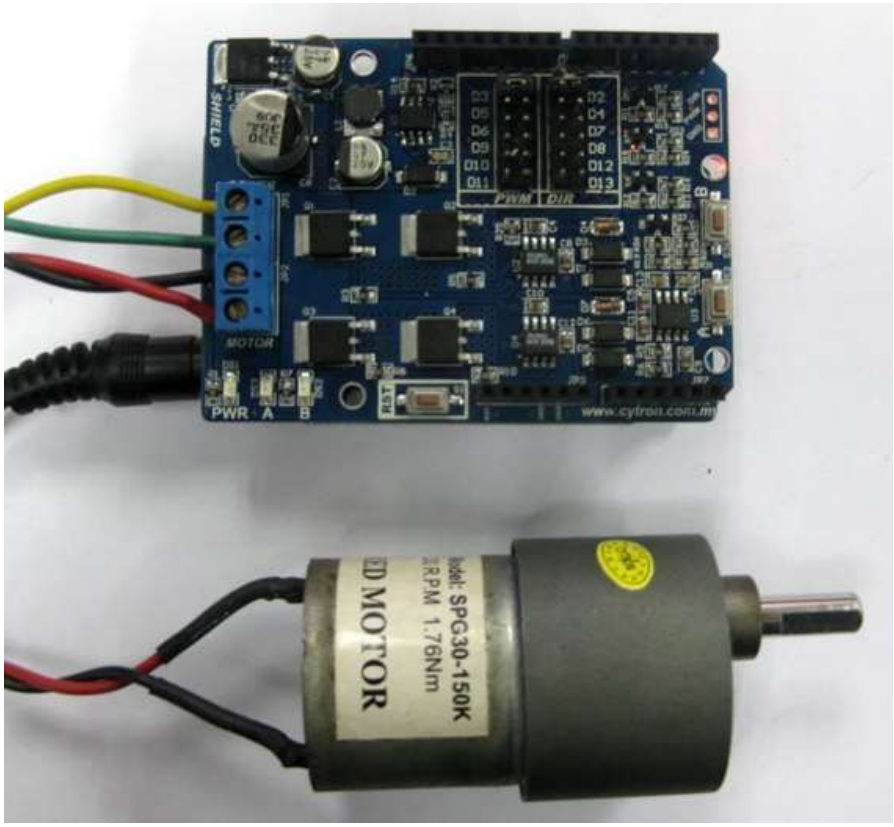
Figure below shows that the shield is stacked on the Arduino UNO. Please ensure that the pins alignment is correct.




Select the pins for PWM and DIR. The default PWM pin is set to D3 while the DIR pin is set to D2. However, other pins may be selected if these pins are already used by other application. Remember to initialize the correct Arduino's digital pin accordingly in the user firmware.




Connect the dc motor and motor power to the terminal block on the shield as shown. Don't forget about the power source for the Arduino main board too.




Power up the Arduino main board and load the firmware first before powering up the motor driver shield.